

CLAIMS

1. Device for connecting a heat exchange pipe (4) that is inserted in a reactor, and said reactor, whereby said pipe (4) is positioned between walls (11) or (11) and (12) that are located on both sides of pipe (4), intended for heating and/or cooling said reactor, whose internal pressure is considerably higher than the atmospheric pressure and than the pressure that prevails inside said pipe (4), whereby said device is characterized in that it comprises a series of cooperating means that comprise connecting means between this pipe (4) and jacket (2a) of said reactor, whereby said means comprise a packing box (21, 22, 23), a flange (28) that is attached to jacket (2a) of the reactor by means of a joint (18), a bellows or an expansion joint (25) that is connected on one side to said packing box (21, 22, 23) and on the other side to said flange (28), whereby said connection allows small-amplitude axial movements and radial movements.

2. Device according to claim 1, wherein said packing box (21, 22, 23) comprises an intermediate stop (24) to take up the stresses exerted on the means that are installed to limit the axial movements while allowing small-amplitude radial movements of entire pipe (4) and of said packing box (21, 22, 23) that work with said flange (28) and/or with bracket (33) that is integral with said flange (28) that is attached to flange (20) that is connected to jacket (2a) of the reactor.

3. Device according to claim 1 or 2, wherein it comprises at least one means for guiding pipe (4) relative to walls (11) or (11) and (12) that are located on both sides of pipe (4).

4. Device according to claim 3, wherein the guiding means is located in the upper portion of pipe (4).

5. Device according to one of claims 1 to 2, wherein it comprises at least two guiding means of pipe (4).

6. Device according to claim 5, wherein at least one guiding means is located in the upper portion of pipe (4) and at least one other guiding means is located in the lower portion of pipe (4).

7. Device according to one of claims 3 to 6, wherein the guiding means that is located in the upper portion of pipe (4) comprises a recess that is intended to accommodate at least one bearing (29).

8. Device according to one of claims 1 to 7, wherein it comprises mechanical means that make it possible to protect bellows (25) from a pressure variation.

9. Device according to claim 8, wherein the mechanical means that make it possible to protect bellows (25) from a pressure variation comprises a chamber (30) on the side of bellows (25) that is linked to the inside of pipe (4).

10. Device according to claim 9, wherein the mechanical means that make it possible to protect bellows (25) from a pressure variation comprise a linking that is established through a restricted passage between chamber (30) and the inside of pipe (4).

11. Device according to claim 10, wherein the mechanical means that make it possible to protect bellows (25) from a pressure variation comprise a linking that is established through a restricted passage between chamber (30) and the inside of pipe (4) that comprises a joint (31).

12. Device according to one of claims 1 to 11, wherein the reactor comprises a system for heating pipe (4) that is a radiant pipe that is fed via a burner comprising a jacket (17) that is connected in an essentially sealed manner to jacket (2a) of the reactor, ensuring the confinement of bellows (25) relative to the outside of said reactor.

13. Device according to one of claims 1 to 12, wherein bellows (25) is located above flange (28) in axial position relative to the axis of pipe (4).

14. Device according to one of claims 1 to 12, wherein bellows (25) is located below flange (28) in axial position relative to the axis of pipe (4).

15. Device according to one of claims 1 to 12, wherein bellows (25) is located above or below flange (28) in radial position relative to the axis of pipe (4).

16. Device according to one of claims 1 to 15, wherein in its lower portion, pipe (4) comprises a restricted section such that its diameter is then from about 10% to about 99% of the diameter of said pipe above said restriction.

17. Device according to claim 16, wherein the height of the restricted section of pipe (4) is from about $0.05 \times$ to about twice the diameter of said tube above said restriction.

18. Device according to one of claims 1 to 17, wherein pipe (4) is a pipe that consists of ceramic material, and walls (11) and (12) are made of refractory material.

19. Device according to one of claims 1 to 18, wherein pipe (4) and walls (11) and (12) are made of zirconia or silicon carbide and preferably silicon carbide.